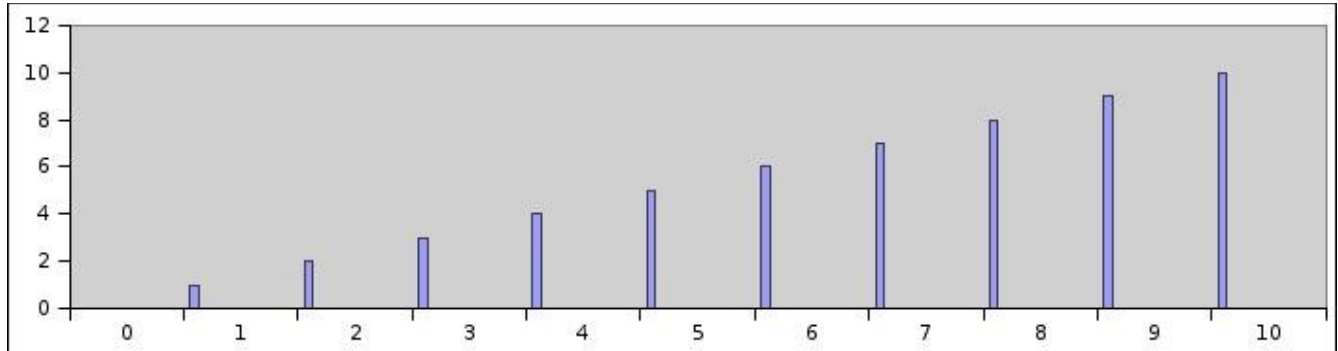


How to add the numbers one to ten really fast

Lets look at a number line representing the numbers one to ten

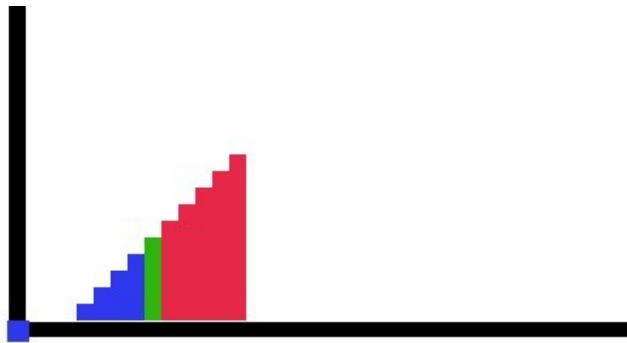


We have a bar that is the same units high as the value of the number

Zero has no height, One is one high, Two is two high, and so on....

Lets make a little more condensed display with multiple colors to show some points

We have the following graph the bars for one to four are blue, the bar for five is green and the bars for six to ten are red. There isn't a bar for zero because doesn't have any height.



Now if we flip the bars for six to ten upside down and move them

over so that the bar for ten is over the place for zero, the bar for nine is over the bar for one, and the bar for eight is over the bar for two and the bar for seven is over the bar of three and the bar for six is over the bar for four we would have a picture that looked like this

We can see that the height of the combination of bars for zero and ten is 10, the height of bars one and nine is 10, the height of bars two and eight is 10, the height of bars three and seven is ten and the height of bars four and six is 10. The height of the five bar is 5



Thus the sum of the heights for the first five bars are $10 + 10 + 10 + 10 + 10 = 50$

or we can write $5 \times 10 = 50$

the sum of the height of the fifth bar is 5

The sum of 50 plus 5 is 55

Thus the sum of the values $0 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55$

or

the sum height of the first five bars plus the height of the sixth bar

$$5 \times 10 = 50 \qquad 5$$

$50 + 5 = 55$ is the sum of all the numbers from zero to ten

This technique can be applied to many problems.

For example suppose we want to sum all the numbers from zero to one hundred.

$$0 + 100 = 100$$

$$1 + 99 = 100$$

$$2 + 98 = 100$$

$$48 + 52 = 100$$

$$49 + 51 = 100$$

$$50 \times 100 = 5000$$

$$50 = 50$$

$$50 = 50$$

$$5000 + 50 = 5050$$

The sum of all numbers from zero to one hundred is 5050